

CLAIMS

I claim:

1. A trench-forming apparatus, comprising:
L-shaped frame rails; and
a removable form;
wherein the removable form is configured to define an inner trench surface of a completed trench and the frame rails are configured to define top edges of the completed trench.
2. The apparatus of claim 1, wherein the L-shaped frame rails comprise a vertical portion and a horizontal portion, the vertical and horizontal portions being at an approximately right angle relative to each other.
3. The apparatus of claim 1, wherein the L-shaped frame rails comprise fixation members that are configured to hold the rails in place within the completed trench.
4. The apparatus of claim 1, wherein the removable form comprises lateral grooves that are adapted to receive the L-shaped frame rails.

5. The apparatus of claim 1, further comprising cross-members that are configured to maintain proper separation of the L-shaped frame rails.

6. The apparatus of claim 5, wherein the cross-members are configured to be releasably secured to the L-shaped frame rails.

7. The apparatus of claim 5, wherein the removable form comprises rectangular transverse notches that are configured to receive the cross-members.

8. The apparatus of claim 5, further comprising an attachment mechanism provided on the cross-members, the attachment mechanism configured to secure the removable form to the cross-members.

9. The apparatus of claim 8, wherein the attachment mechanism comprises adhesive.

10. The apparatus of claim 8, wherein the attachment mechanism comprises double-sided tape.

11. The apparatus of claim 1, wherein the L-shaped frame rails comprise openings that facilitate connection to cross-members that maintain proper separation of the L-shaped frame rails.

12. The apparatus of claim 1, wherein the removable form comprises a bottom surface that is sloped relative to a top surface of the form to facilitate formation of a sloped trench.

13. The apparatus of claim 1, wherein the removable form comprises an inner core and an outer shell.

14. A frame rail for use in forming a trench, the frame rail comprising:
a vertical portion;
a horizontal portion that extends from the vertical portion at an approximately right angle relative to the vertical portion; and
fixation members that extend outwardly from the frame rail, the fixation members being configured to hold the rails in place within a completed trench;
wherein the frame rail includes no other vertical portions.

15. The frame rail of claim 14, wherein the horizontal portion comprises openings that facilitate connection of removable cross-members, a grate, or both.

16. The frame rail of claim 14, wherein the horizontal portion is configured for insertion into a removable form.

17. A removable form for use in forming a trench, the removable form comprising:

a top surface;

a bottom surface; and

lateral grooves that are configured to receive members that are used to support the form in place within an excavated trench during trench completion.

18. The removable form of claim 17, wherein the lateral grooves are configured to receive frame rails that define upper edges of a completed trench.

19. The removable form of claim 17, wherein the lateral grooves are configured to receive removable clips that attach to frame rails that define upper edges of a completed trench.

20. The removable form of claim 17, wherein the lateral grooves are angled relative to the top surface of the form to facilitate formation of a sloped trench.

21. The removable form of claim 17, further comprising a rectangular transverse notch that is configured to receive a removable cross-member that attaches to frame rails that define upper edges of a completed trench.

22. The removable form of claim 17, wherein the form comprises an inner core and an outer shell.

23. A method for forming a trench, the method comprising:
inserting frame rails that define upper edges of the trench into a removable form;
positioning the frame rails coupled with the removable form in an excavated trench;
pouring hardenable material in a space between the removable form and trench walls; and
removing the removable form after the hardenable material has cured to an appropriate degree.

24. The method of claim 23, further comprising supporting the frame rails within the excavated trench using the frame rails.

25. A method for forming a trench, the method comprising:
connecting frame rails that define upper edges of the trench using removable cross-members;
adhering a removable form to the cross-members;
positioning the frame rails, removable cross-members, and removable form in an excavated trench;
pouring hardenable material in a space between the removable form and trench walls;
removing the removable cross-members from the frame rails; and
removing the removable form.

26. The method of claim 25, wherein adhering a removable form to the cross-members comprises adhering the removable form to the cross-members using an adhesive.

27. The method of claim 25, wherein adhering a removable form to the cross-members comprises adhering the removable form to the cross-members using double-sided tape.

28. A method for forming a trench, the method comprising:

connecting frame rails that define upper edges of the trench to removable cross-members to form a trench-forming apparatus;

attaching a removable form to the trench-forming apparatus such that the removable cross-members are received by rectangular transverse notches of the removable form;

positioning the trench-forming apparatus and removable form in an excavated trench;

pouring hardenable material in a space between the removable form and trench walls;

removing the removable cross-members from the frame rails; and

removing the removable form.

29. The method of claim 28, wherein attaching a removable form to the trench-forming apparatus comprises inserting the frame rails into the removable form.

30. The method of claim 28, wherein attaching a removable form to the trench-forming apparatus comprises adhering the removable form to the removable cross-members.

31. A trench-forming apparatus, comprising:

frame rails including a horizontal portion that is configured for insertion into a removable form; and

a removable form including lateral grooves that are configured to receive frame rails;

wherein the frame rails are configured to support the removable form in an excavated trench when the horizontal portions are inserted into the lateral grooves of the removable form.

32. The apparatus of claim 31, wherein the frame rails comprise fixation members that extend outwardly from the frame rails.

33. The apparatus of claim 31, further comprising removable cross-members that connect the frame rails.

34. The apparatus of claim 33, wherein the removable form comprises rectangular transverse notches that are configured to receive the removable cross-members.

35. The apparatus of claim 31, wherein the removable form comprises an inner core and an outer shell.

36. A trench-forming apparatus, comprising:

frame rails;

removable clips configured to releasably attach to the frame rails, the clips comprising a horizontal portion that is configured for insertion into a removable form; and

a removable form including lateral grooves that are configured to receive the clips;

wherein the frame rails are configured to support the removable form in an excavated trench using the removable clips when the horizontal portions of the clips are inserted into the lateral grooves of the removable form.

37. The apparatus of claim 36, wherein the removable clips attach to the frame rails using threaded fasteners.

38. A method for forming a trench, the method comprising:

connecting removable clips to frame rails;

attaching a removable form to the frame rails using the removable clips by inserting horizontal portions of the removable clips into lateral grooves of the removable form;

positioning the frame rails, removable clips, and removable form in an excavated trench;

pouring hardenable material in a space between the removable form and trench walls; and

removing the removable form.

39. The method of claim 38, further comprising removing the removable clips from the frame rails.

40. A frame rail made of a light gauge, rigid material, the frame rail comprising:

a first vertical portion;

a first horizontal portion connected to the first vertical portion;

a second vertical portion connected to the first horizontal portion; and

a second horizontal portion that is configured for insertion into a lateral groove of a removable form.

41. The frame rail of claim 40, wherein the first horizontal portion comprises openings.

42. The frame rail of claim 40, wherein the frame rail is made of approximately 16 to 10 gauge steel.

43. A frame rail made of a light gauge, rigid material, the frame rail comprising:

a generally vertical portion;

a central portion connected to the generally vertical portion, the central portion comprising unitarily fixation tabs that are formed through a punching process; and

a horizontal portion that is configured for insertion in a lateral groove of a removable form.

44. The frame rail of claim 43, wherein the generally vertical portion comprises three distinct sub-portions.

45. The frame rail of claim 43, wherein the horizontal portion comprises openings.

46. The frame rail of claim 43, wherein the frame rail is made of approximately 16 to 10 gauge steel.

47. The frame rail of claim 43, further comprising a second vertical portion connected to the horizontal portion and a second horizontal portion connected to the second vertical portion, the horizontal portion, second vertical portion, and second horizontal portion being configured for insertion into a lateral groove of a removable form.

48. A frame rail made of a light gauge, rigid material, the frame rail comprising:

- a first generally vertical portion including unitarily fixation tabs formed through a punching process;

- a horizontal portion connected to the first generally vertical portion; and

- a second generally vertical portion connected to the horizontal portion, the second generally vertical portion including unitarily fixation tabs formed through a punching process.

49. The frame rail of claim 48, wherein the first generally vertical portion comprises a first angled portion, a first vertical portion, a second angled portion, a second vertical portion, and a third angled portion.

50. The frame rail of claim 48, wherein the second generally vertical portion comprises a first angled portion, a first vertical portion, a second angled portion, a second vertical portion, a third angled portion, a third vertical portion, and a fourth angled portion.

51. The frame rail of claim 48, wherein the horizontal portion comprises openings.

52. The frame rail of claim 48, wherein the frame rail is made of approximately 16 to 10 gauge steel.

53. A frame rail made of light gauge, rigid material, the frame rail comprising:

fixation tabs that are unitarily-formed with the rail.

54. The frame rail of claim 53, comprising a horizontal portion that includes openings.

55. The frame rail of claim 53, wherein the frame rail is made of approximately 16 to 10 gauge steel.

56. A removable form for use in forming a trench, the removable form comprising:

a top surface;

a bottom surface; and

rectangular transverse notches formed in the top surface, the transverse notches being configured to receive cross-members that connect frame rails together.

57. The removable form of claim 56, further comprising lateral grooves that are configured to facilitate support of the form in an excavated trench.

58. The removable form of claim 57, wherein the lateral grooves are angled relative to the top surface of the form to facilitate formation of a sloped trench.

59. The removable form of claim 57, wherein tops of the lateral grooves align with bottoms of the rectangular transverse notches.

60. The removable form of claim 56, wherein the form comprises an inner core and an outer shell.

61. A removable form for use in forming a trench, the removable form comprising:

a top surface;

a bottom surface; and

internal score lines that define integral but separable portions of the form, the score lines facilitating removal of the form by facilitating removal of the form in separate pieces.

62. The removable form of claim 61, further comprising lateral grooves formed in the bottom surface.

63. The removable form of claim 61, further comprising rectangular transverse grooves formed in the top surface.